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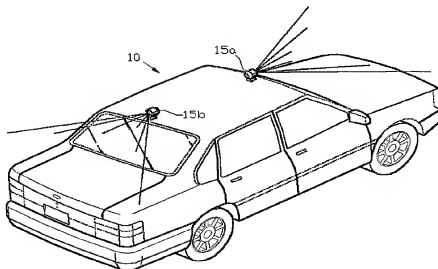
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(54) Title: SYSTEM O FVEHICLE FOR MONITORING SURROUNDING THEREOF



(57) Abstract: Disclosed is a system for monitoring the surroundings of a vehicle by producing images of the surroundings in real-time and outputting and storing the images, thereby enabling a driver to properly cope with any changing situations or obstacles around the vehicle. The vehicle surroundings monitoring system comprises: a camera mounted on at least one portion of the vehicle to produce images of the surroundings of the vehicle; a hands free kit provided inside the vehicle; a memory chip that can be inserted into the hands-free kit to store image data taken through the camera; and an output section for outputting the data stored in the memory chip.

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**SYSTEM OF VEHICLE FOR MONITORING SURROUNDINGS THEREOF**

## Technical Field

The present invention relates to a system for  
5 monitoring the surroundings of a vehicle, and more  
particularly to a system for monitoring the surroundings of a  
vehicle by producing images of the surroundings in realtime  
and outputting and storing the images to properly cope with  
changing situations or obstacles around the vehicle.

10

## Background Art

With the rapid increase in the number of vehicles,  
there is a growing need for good driving manners and skills.  
Drivers who lack driving etiquettes or sufficient skills may  
15 cause traffic violations such as illegal U-turn or left-turn  
and traffic accidents such as rear-end collisions or crashes.

Drivers often experience troubles or inconveniences.  
Particularly, "Sunday drivers" or beginners often have  
parking problems because they are not used to watch both the  
20 front and rear of their cars. Drivers implicated in a car  
accident may have difficulties, in settlements when  
sufficient evidence showing the primary cause of the accident  
is lacking.

If any of the accident-involved vehicles is equipped  
25 with a camera or a camcorder for producing images of the  
conditions of the accident and storing the images, it can  
provide evidence helpful to settle disputes between drivers.  
However, the camera or the camcorder will not be useful if it  
does not record in realtime as the accident takes place.

30

To solve the above problems, there is provided a system  
for producing images of the surroundings of a vehicle using a

camera mounted in the vehicle in realtime and outputting the images through a display monitor installed inside the vehicle, thereby enabling a driver to properly cope with any changing situations or obstacles around the vehicle.

5

#### Disclosure of the Invention

Therefore, the present invention has been made in view of the above-mentioned problems, and it is an object of the present invention to provide a system for monitoring the  
10 surroundings of a vehicle by producing images of the surroundings in realtime and outputting and storing the images, thereby enabling a driver to properly cope with any changing situations or obstacles around the vehicle.

In order to accomplish the above object of the present  
15 invention, there is provided a system for monitoring the surroundings of a vehicle, which comprises: a camera mounted on at least one portion of the vehicle to produce images of the surroundings of the vehicle; a hands-free kit provided inside the vehicle; a memory chip that can be inserted into  
20 the hands-free kit to store image data taken through the camera; and an output section for outputting the data stored in the memory chip.

#### Brief Description of the Drawings

25 The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a vehicle equipped with  
30 a vehicle surroundings monitoring system according to the present invention;

FIG. 2 is a view showing the construction of a vehicle surroundings monitoring system according to the present invention;

FIG. 3 is a view showing the inside structure of the vehicle in FIG. 1; and

FIG. 4 is a control block diagram of a vehicle surroundings monitoring system vehicle according to the present invention.

#### 10 Best Mode for Carrying Out the Invention

Reference will now be made in detail to the preferred embodiments of the present invention.

FIG. 1 is a perspective view of a vehicle equipped with a vehicle surroundings monitoring system according to the present invention. FIG. 2 shows the construction of a vehicle surroundings monitoring system according to the present invention. FIG. 3 shows the inside structure of the vehicle in FIG. 1 equipped with a vehicle surroundings monitoring system. FIG. 4 is a block diagram of the vehicle surroundings monitoring system.

The vehicle surroundings monitoring system according to the present invention can be used for a vehicle 10 as shown in FIG. 1.

Referring to FIG. 3, the vehicle 10 has a driver's seat 14 and a passenger's seat 15 on the left and right of an audio player 12 and a gear shift lever 13. A steering wheel 16 is provided at the center of the driver's side. Also, an accelerator paddle 17 and a brake paddle 18 are provided below the steering wheel 16.

The vehicle surroundings monitoring system used for the vehicle 10 having the above structure includes a plurality of

cameras 15a and 15b mounted respectively on the front and rear sides of the vehicle 10, a hands-free kit 20, a memory chip 40 that can be inserted into the hands-free kit 20 and an output section.

5 For the convenience in illustration, FIG. 1 depicts the two cameras 15a and 15b mounted on the outer surface of the vehicle's roof. However, it would be more preferable to provide the cameras 15a and 15b respectively on the inside surfaces of the front and rear windows of the vehicle 10.

10 Any video cameras that are generally available to the public can be adopted as the cameras 15a and 15b. An image of a photographed object that has passed through an optical lens of a video camera, so-called "video movie," is formed as an optical image on the front end of a camera tube. The  
15 optical image is transformed into an image of charge corresponding to the brightness of the optical image on the back end of the camera tube.

At this time, an electron beam scans the camera tube as does in a television picture tube screen, thereby generating  
20 a current proportional to the image of charge and forming a video signal ("image data").

The image data is processed by a control section 50 to meet NTSC (National Television Standards Committee) standard. When the control section 50 is connected to the output  
25 section, for example, a monitor 45 or a display window 32 of a mobile phone 30, images can be displayed.

The hands-free kit 20 into which the mobile phone 30 can be plugged is fixed on top of a front frame 19 of the vehicle 10. The hands-free kit 20 consists of a main body  
30 22, a connector 25 for connecting the hands-free kit 20 to the front frame 19 and a microphone 27.

The connector 25 can be fixed onto the front frame 19 by means of an adhesive or a screw connection. FIG. 3 illustrates a hands-free kit having a microphone 27 provided outside to send speech signals and a speaker incorporated into the main body 22 to receive speech signals. However, it is also possible to use an ear set incorporating both the microphone and the speaker.

A receiving part 22 is formed on one side of the hands-free kit 20 to receive the memory chip 40. The memory chip 40 can be any of the chips generally used for digital cameras. If required, a mega-byte or giga-byte memory chip can be used.

The output section provided inside the vehicle 10 displays images of the data stored in the memory chip 40. Thus, it is preferable to provide a monitor 45 as the output section to complete the monitoring system according to the present invention.

As shown in FIG. 2, the monitor 45 is positioned above the audio player 12. A generally available small television or navigator can be used as the monitor 45. The monitor 45 is connected to the hands-free kit 20 by a data line (not shown).

Also, as shown in FIG. 4, the control section 50 is provided in the main body 22 of the hands-free kit 20 to control data transmission between the memory chip 40 and the monitor 45. The control section 50 includes an image processor 52 for processing the data stored in the memory chip 40 to be outputted as images and a memory processor 54 for partially deleting the data. The two processors can be operated by an operator 24 provided in the main body 22 of the hands-free kit 20.

During operation of the vehicle surroundings monitoring system having the above construction, the front and rear cameras 15a and 15b produce images of the surroundings in front of and behind the vehicle 10 in realtime. Since the  
5 images are displayed on the monitor 45, the driver can easily cope with any inconvenience or difficulties while driving or parking.

For example, when putting the vehicle 10 into reverse to back out from an alleyway or a parking lot, the driver can  
10 see through the monitor 45 if there is a child or a pet or any other obstacle behind the vehicle 10, thereby preventing an accident. The monitor 45 can eliminate rear blind spots that cannot be detected by both side mirrors and give the driver better views of the surroundings of the vehicle.

While driving the vehicle 10 on a road, the vehicle  
15 surroundings monitoring system produces images of every situation or accident occurring in front of or behind the vehicle 10 in realtime through the front and rear cameras 15a and 15 and stores the images in the memory chip 40. The  
20 stored images can be useful at a later time as evidence showing the primary cause of an accident.

The memory chip 40, however, has a limited capacity of storing image data. The driver should operate the operator  
24 on occasions to control the memory processor 54 in the  
25 control section 50 to delete unnecessary data from the memory chip 40 or to format the memory chip 40 to make use of it again.

The vehicle surroundings monitoring system according to the present invention produces images of the surroundings of  
30 the vehicle 10 in realtime and outputs and stores the images, thereby enabling the driver to properly cope with any

changing situations or obstacles around the vehicle 10.

Although the monitor 45 has been explained as an example of the output section, a display window 32 of a mobile phone 30 can also serve as the output section, using  
5 mobile services for data transmission through the internet.

Also, although the cameras 15a and 15b have been explained as being positioned at front and rear sides of the vehicle 10, they can also be positioned at the lateral sides of the vehicle 10 to produce images of the surroundings at  
10 both sides of the vehicle 10.

#### Industrial Applicability

As can be seen from the foregoing, the vehicle surroundings monitoring system according to the present  
15 invention produces images of the surroundings of a vehicle in realtime and outputs or stores the images, thereby enabling a driver to property cope with any changing situations and obstacles around the vehicle.

While this invention has been described in connection  
20 with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiment and the drawings, but, on the contrary, it is intended to cover various modifications and variations within the spirit and  
25 scope of the appended claims.



## Claims

1. A system for monitoring surroundings of a vehicle, which comprises:
- 5 a camera mounted on at least one portion of the vehicle to produce images of the surroundings of the vehicle;
- a hands-free kit provided inside the vehicle;
- a memory chip that can be inserted into the hands-free kit to store image data taken through the camera; and
- 10 an output section for outputting the data stored in the memory chip.
2. The system as claimed in claim 1, wherein said output section is at least one of a monitor mounted inside
- 15 the vehicle or a display window of a mobile phone plugged into the hands-free kit to display images taken through the camera.
3. The system as claimed in claim 1 or 2, further
- 20 comprising a control section for controlling data transmission between said memory chip and said output section.
4. The system as claimed in claim 3, wherein said
- 25 control section includes: an image processor for processing the data stored in the memory chip to be outputted as images; and a memory processor for partially deleting the data.

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FIG 1

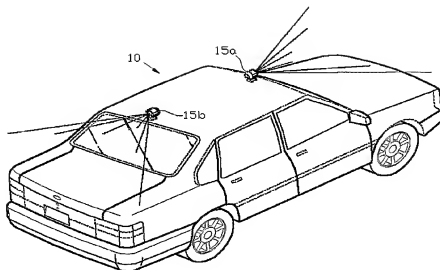
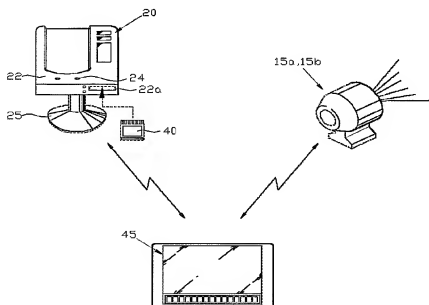


FIG 2



2/2

FIG 3

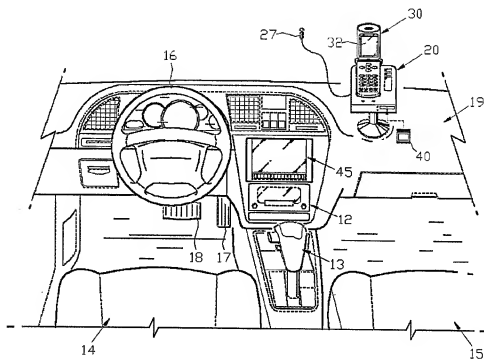
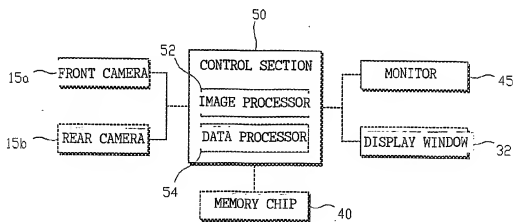


FIG 4



## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/KR2004/002157
**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 B60R 1/00**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC7 B60R1/00, 1/02, 1/08, 11/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
KR, JP IPC as aboveElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Patent Search System in Korean Intellectual Property Office**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 2003-45757A(KIM, JIN YEOL) 11 June 2003 See the whole document	1-4
X	US 6,580,373B1(Tuner Corporation) 17 June 2003 See claim1, embodiment1, fig4	1-4
A	US 6,583,730B2(Leng-Mekra North America, L.L.C) 24 June 2003 See the whole document	1-4
A	US 5,574,443A(Chi-Sheng Hesieh) 12 November 1996 See the whole document	1-4

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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Date of mailing of the international search report

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/KR2004/002157

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